

ARTICLE XXIV.—*On a Collection of Birds from Chapada, Matto Grosso, Brazil, made by Mr. Herbert H. Smith.* By J. A. ALLEN.

PART I.—OSCINES.

The present collection was formed under the direction of Mr. Herbert H. Smith, the well-known Brazilian explorer and entomological collector, by members of his party, during the years 1882-86, chiefly in the immediate vicinity of Chapada, in the Province of Matto Grosso, Brazil. The collection numbered about 6000 specimens, of which 4000 were purchased by the American Museum of Natural History in 1887, when the collection first reached this country. All but about 500 specimens of the remaining 2000 are still in storage at this Museum, and through the kindness of Mr. Smith have been used in the preparation of the present paper, which is thus based on a strictly local collection of about 5500 specimens,—doubtless by far the largest and most important single collection of birds ever made for scientific purposes from a limited district anywhere in South America.

Chapada is in the Campo region of the Bolivian border of Matto Grosso, about thirty-five miles southwest of Cuyaba, on a tributary of the Cuyaba River, at an altitude of about 2500 feet. The forests are limited to the edges of the table land and the borders of the streams, with here and there little islands of forest growth in the Campo.

About nine-tenths of the collection was made within a radius of ten miles from Chapada; the greater part of the rest on occasional brief collecting trips to other points varying from fifteen to thirty-five miles distant from Chapada. These points are : (1) Abrilongo, twelve miles from Chapada, at an altitude of about 1500 feet ; (2) Cachoeira, about thirty miles distant, with an estimated altitude of 1200 feet ; (3) Cuyaba, about thirty-five miles northeast from Chapada, with an altitude of 1500 feet. Besides these points, about four months were spent in the vicinity of Corumba, 300 miles south of Chapada, in the flood plain of the Paraguay River. In the following list, when no locality is especially mentioned, Chapada or its immediate vicinity is to be understood.

The bird collection, though so large, was made incidentally to the special work in hand, namely, an exhaustive collection (about 400,000 specimens were obtained) of the insect fauna of the region. The greater part of the specimens were prepared by Mrs. Herbert H. Smith, whose later work in a similar line in Mexico for Messrs. Salvin and Godman has called forth generous recognition and hearty commendation. (See *Ibis*, 1889, p. 240.) Much of the collecting was done by her brother, Mr. A. E. Smith, with the aid of two German lads employed as assistants.

Bird collecting at Chapada was steadily prosecuted for three years, without regard to season or the condition of the birds. Hence the species, when at all common, are represented in large series, and include all phases of plumage, from the half-fledged young to old birds in worn plumage or in molt. The best portion of the year for collecting proved to be the rainy season, lasting from September till March, which period includes the breeding season. In the dry season the birds were fewer and more difficult to obtain. As, however, many of the birds are of local distribution over the area included in the field of operations, in accordance with their predilection for an open or a forested country, and as the work was carried on now at one point and now at another, the same species is rarely represented equally throughout the different months of the year, even when a permanent resident of the region.

Although, as already stated, the collection was not made by professional ornithological collectors, it numbers not far from 350 species, and may be considered as fairly exhaustive for the locality. Unfortunately the specimens are unaccompanied by notes, beyond the date of collection, the sex as determined by dissection, the color of the eyes, and measurements of the specimen before skinning.* No notes were made as to the habits or relative abundance of the species; hence the specimens themselves and the dates of collecting are the only data as to the relative abundance or seasons of occurrence of the species. A small collection of eggs accompanying the birds, and the many newly-fledged birds, indicate the months of October and Novem-

* These latter, however, have not been used in the present paper, it seeming preferable to have the measurements taken by a single person under my own supervision. The measurements here used have been carefully made by Mr. C. B. Isham, an assistant in this Department of the Museum.

ber as the breeding season of the resident species, which, in some instances at least, appears to extend from the latter part of September till into December. The season of molt varies somewhat with different species, but in general terms may be said to extend from the latter half of December till into March. It evidently begins a month or two earlier in some species than in others.

The larger series throw much light on phases of plumage due to age and sex, and often include phases not heretofore described, including females of species hitherto known only from the male sex. They also add much to our previous knowledge of the range of individual variation in respect to size, coloration, etc., of a large number of even the commoner species. Many species hitherto rare in collections are often represented in series of 30 to 50 specimens. The collection, however, as a whole, contains singularly few duplicates, for generally so many specimens are required to represent the seasonal and other variations of the species, that when these are set aside few are left as duplicates.

Since this collection came into the possession of the Museum, some four years ago, much use of it has been made in the general work of the Museum on South American birds, and several papers have already been published based in part or wholly on this material. These include (1) "Descriptions of New Species* of South American Birds, with Remarks on various other little known Species" (this Bulletin, Vol. II, No. 3, pp. 137-151, June, 1889); (2) "On *Cyclorhis viridis* (Vieill.) and its near Allies, with Remarks on other Species of the Genus *Cyclorhis*" (*ibid.*, pp. 123-135, June, 1889); (3) "Remarks on Individual and Seasonal Variation in a large series of *Elainea* from Chapada, Matto Grosso, Brazil, with a Revision of the Species of the restricted Genus *Elainea*" (*ibid.*, pp. 183-208, Oct., 1889); all by the present writer. New species or subspecies elsewhere described are (1) *Xiphorhynchus rufodorsalis* Chapman (this Bulletin, II, p. 160, July, 1889), and (2) *Xiphocolaptes major castaneus* Ridgway (Proc. U. S. Nat. Mus., XII, 1889, p. 17).

In revising the nomenclature of the species here treated it has been found necessary to adopt in a few instances earlier names

* The following new species are from the Smith Collection: (1) *Platyrrhynchus bifasciatus*, (2) *Euscarthmus ochropterus*, (3) *Sublegatus virescens*.

[September, 1891.]

than those heretofore in current use, notably certain of the names given in 1773 by Philipp Ludwig Statius Müller in the Supplement volume of his edition of Linné's "Systema Naturæ." Although attention was called to these names by the late John Cassin in 1864 (Proc. Acad. Nat. Sci. Phila., 1864, pp. 234-257), and some of them have since been adopted, others have been ignored, according to the predilections of the different authors who have had occasion to treat the species to which Müller's names relate.

1. ***Turdus fuscescens* Steph.**—Two specimens—♂, Feb. 21, 1883; "♀?" Nov. 4, 1882, both taken at Chapada. These specimens extend the range of this species far south of any point from which it has been previously recorded. Mr. Seebohm (Cat. Bds. Brit. Mus., V, 1881, p. 204) gives its South American distribution as "north of the Amazon."

2. ***Turdus fuscescens salicicolus* Ridgw.**—A single specimen (♀) typically representing this subspecies was taken March 27, 1883. It is of special interest, not only on account of the latitude, but as offering a case of a western North American race migrating far south in South America, instead of remaining in Mexico or Central America, as is the rule with these western forms.

3. ***Turdus albicollis* Vieill.**—This species is represented by three specimens, as follows: ♂, June 6, 1885; ♀, Oct. 28, 1882; a half-grown fledgling, Nov. 23, 1882.

The female is much browner above than the male, with the head nearly concolor with the back, and the throat markings are brownish instead of deep black. In the male the head is dusky, washed with olive, and the throat black narrowly streaked with white, the black on the throat in both sexes greatly predominating over the white.

The half-fledged bird has the upper surface much darker than in the adult, with the scapulars and interscapulars obscurely tipped with blackish, and with conspicuous shaft-stripes of pale chestnut; wing-coverts all tipped with pale chestnut, the lesser coverts also with shaft-stripes of the same color. Below blotched with broad cross-bars of blackish, the breast and sides pale yellowish brown, the middle of the abdomen white.

A set of three eggs accompanies the female, taken October 28, 1882. They measure 1.08 x .80 in., 1.05 x .82, 1.09 x .82 in. The ground color is bluish white, thickly sprinkled with fine dots of reddish, with very large patches of the same color, sometimes nearly covering the larger end, mixed with similar blotches of lilac brown.

4. *Turdus albiventer* Spix.—This species is represented by a series of 19 specimens, including about an equal number of males and females, one young bird in first plumage, and also a nest and two sets of eggs. These latter were taken Oct. 12 and Oct. 19, and the full-grown fledgling Nov. 28. Specimens were collected in nearly every month of the year, showing the species to be resident.

There is considerable seasonal variation in color, breeding birds (taken Oct.–Nov.), as compared with specimens collected in March and April, often presenting a strong shade of cinnamon on the breast and abdomen, of which there is only very slight trace in what may be termed 'winter' specimens. The forehead is often decidedly brownish or washed with rusty, irrespective of season; though generally most strongly so in the female, which has the whole head usually browner and more nearly concolor with the back than in the male. The female also averages slightly smaller than the male, in which the wing ranges from 4.45 in. to 4.76, against 4.28 to 4.54 in the female.

The young bird in first plumage differs from the adults in being everywhere washed with pale cinnamon below, marked with faint blackish cross-bars; the general color above is much less olivaceous, with narrow whitish shaft-lines, and all the coverts conspicuously tipped with pale rusty.

Eight or ten sets of the eggs, taken at different dates in October, of this species, show the eggs to be very variable in size and form as well as in color. They are generally elongated, measuring about 1.15 x .90 in. The ground color varies from pale clear bluish white to a yellowish bluish white; the markings are generally fine, in the shape of oblong reddish brown dots, covering from about one-third to nearly the whole of the surface. The markings vary in color from russet brown to hazel.

5. *Mimus modulator* (Gould).— This species is probably resident, as in the series of 25 specimens each month of the year is represented except February and October. The specimens taken in April, May, June, and July are nearly all more or less strongly suffused below with buff, as compared with specimens taken later in the season, some of which latter present almost no buffy tinge. There is evidently much individual variation in this respect, specimens taken at nearly the same date differing greatly in the amount of buffy suffusion of the ventral surface. In January the dark dull gray is generally but slightly tinted with buff. The breast and fore-neck are generally at all times distinctly ashy, in contrast with the lighter throat and abdomen. The amount of rusty brownish suffusion on the lower back and rump is similarly variable, as are other features of the coloration, including the dusky stripes on the flanks.

The length of the wing in the males ranges from 4.06 to 4.38 in., the tail from 4.60 to 5.00, the exposed culmen from .67 to .78. Ten males average as follows: wing, 4.19; tail, 4.84; exposed culmen, .73. Six females average: wing, 4.06; tail, 4.77; culmen, .73. The females thus average slightly smaller than the males.

A set of three eggs, collected Nov. 7, 1882, is accompanied by the parent. They measure 1.03 x .80. The ground color is bluish white, marked thickly over the whole surface with pale reddish brown, but more thickly over the larger end.

6. *Mimus triurus* (Vieill.).—Represented by a single specimen from Piedra Blanca, Bolivia, April 22, 1886.

7. *Polioptila dumicola* (Vieill.).— One specimen, ♂ ad., Corumba, April 12, 1886.

8. *Polioptila boliviana* Scf.—Thirteen specimens, as follows: Chapada, January and May, 10 specimens; Abrilongo, Feb. 20, 1885, 2 specimens; Cachoeira, Feb. 4, 1886, 1 specimen. These all agree in the whiteness of the underparts, and other characters, distinguishing *P. boliviana* from *P. dumicola*, as claimed by Baird (Rev. Am. Birds, 1864, p. 73), and especially by Leverkühn (Journ. f. Orn., 1889, p. 109). They are, however, closely related, and may be merely geographical races of the same species.

9. *Donacobius atricapillus* (Linn.).—Two specimens, ♂ and ♀ ad., Corumba, Feb. 27, 1886.

10. *Campylorhynchus unicolor* Lafr.—Two specimens, an adult and a young bird partly in first plumage, Uacuryzal (near Corumba), Feb. 14, 1886.

In the young bird the interscapulars are tipped with a broad blotch of dusky, with below this a broad bar of the same color, bordered both above and below with a broad bar of grayish fulvous, giving the effect of two light and two dark bars across each feather, with a whitish shaft-streak. In the adult the interscapulars are distinctly blotched with dusky brown,—a feature not mentioned by Mr. Sharpe (Cat. Bds. Brit. Mus., VII, p. 190).

11. *Troglodytes musculus* (Naum.).—This species is represented by 10 specimens, taken in April, May, July, September, October, and November. They present considerable variation in respect to the distinctness of the narrow bars on the back and in the depth of the rufous tints.

12. *Thryophilus galbraithi* (Lawr.).—A single specimen, ♀ ad., Chapada, Jan. 17, 1883, is provisionally referred to this species, which some authors (Salvin & Godman, Biol. Centr.-Am., Aves, p. 85) synonymize with *T. leucotis* (Lafr.). Compared with a series of four Panama specimens of *T. galbraithi*, including the type, it is on the whole slightly paler, and the ear-coverts are a little more strongly streaked with brown, but the average differences between this specimen and the Panama birds are not greater than those between the extremes of the Panama series. It is doubtless the *T. galbraithi* of Pelzeln (Orn. Bras., p. 47) from Goiaz and Cuyaba, and may prove separable as a race or subspecies of the *T. leucotis* group (*cf.* Sharpe, Cat. Bds. Brit. Mus., VII, p. 209, footnote). Unfortunately specimens of true *T. leucotis* are not available for examination.

13. *Thryothorus genibarbis* Swains.—The 15 specimens representing this species were taken as follows: April, 1; May, 8; June, 3; August, 1; September, 1; October, 1.

In coloration the series is very uniform, the depth of color varying within rather narrow limits. In three the bars on the

terminal half of the tail are broken and irregular, instead of sharp and regular as is usually the case. The series measures as follows: wing, 2.26-2.59 in., averaging 2.45; tail, 2.28-2.64, averaging 2.47; exposed culmen, .59-.67, averaging, .63.

14. *Anthus rufus* (Gmel.). — Two specimens, ♂ and ♀, Corumba, Feb. 28 and March 2, 1886.

15. *Compsothlypis pitiaiyuma* (Vieill.). — Chapada, 6 specimens, taken April 7, July 11, and Sept. 3-26; Abrilongo, 1 specimen, Feb. 18.

16. *Geothlypis velata* (Vieill.). — Corumba, 1 specimen, ♂ ad., Feb. 4; Chapada, 31 specimens (22 ♂, 8 ♀, 1 juv.), taken as follows: January, 2; February, 1; March, 3; April, 7; June, 1; July, 2; August, 3; September, 5; October, 4.

The young males at first resemble the females; at apparently the second molt they begin to assume the livery of the male, acquiring gradually the ashy cap and the black frontlet and eye-stripe. This molt begins in February and is completed in April, although the auriculars may not become wholly black till later, the auriculars remaining olive, or mixed olive and black, after the ashy cap and the black of the forehead and lores have been fully acquired.

A young bird just out of the nest is uniform olive sepia above, with the breast and flanks umber, passing into pale maize yellow on the abdomen.

17. *Basileuterus hypoleucus* Bon. — This species, usually rare in collections, is represented by a series of 81 specimens, taken as follows: January, 7; February, 9; March, 12; April, 9; May, 11; June, 7; July, 9; August, 6; September, 5; October, 4; November, 0; December, 2. Two or three of the January specimens are slightly in molt—the only examples showing signs of molt. What seem to be young birds are washed faintly with pale buffy brown on the flanks and occasionally over most of the ventral surface, and the olive green of the back is faintly obscured with brown anteriorly. Birds in very high plumage show a wash of olive yellow over the middle of the breast and belly, in a few examples amounting to a more or less distinct central spot on the lower breast.

Twelve males measure as follows : wing, 2.34-2.58 in., averaging 2.47; tail, 2.28-2.54, averaging 2.37; exposed culmen, .38-.43, averaging .41. Twelve females are somewhat smaller, as follows : wing, 2.22-2.40, averaging 2.30; tail, 2.14-2.35, averaging 2.23; exposed culmen, .39-.42, averaging .40.

18. *Basileuterus leucophrys* Pelz.—Two specimens, ♂ and ♀, Chapada, Oct. 20, 1883.

19. *Basileuterus flaveolus* Baird.—A series of 54 specimens, representing every month of the year except December, taken as follows : January, 1; February, 4; March, 6; April, 4; May, 11; June, 3; July, 5; August, 3; September, 4; October, 8; November, 5. Specimens taken after the fall molt are deeper yellow below than specimens collected in the breeding season, but are not otherwise different. The series as a whole presents remarkable uniformity in coloration. Specimens from Bahia, from the Lawrence Collection, are not appreciably different.

Thirty males give the following measurements : wing, 2.32-2.60 in., averaging 2.50; tail, 2.34-2.69, averaging 2.55; exposed culmen, .45-.52, averaging .47. The females are slightly smaller.

Two eggs of this species, taken with the parent birds, Oct. 21, 1882, are dull white, marked with bright reddish brown dots, which are small and much scattered over the smaller end, and aggregated at the larger so as to nearly cover the surface. They measure .80 x .60.

20. *Vireo chivi* (Vieill.).—The series of 42 specimens was taken as follows : January, 3; February, 6; March, 1; April, 3; August, 3; September, 11; October, 10; November, 3; December, 2. The months of May, June, and July are unrepresented, or more strictly, the period from April 7 to August 13—about four months of the winter season. The species is thus apparently a migrant in the vicinity of Chapada. One of the November specimens (Nov. 27) is still partly in first plumage, the head being buffy brown, with more or less brown mixed throughout the upper plumage.

In this large series there is a comparatively small range of variation in either size or coloration. Ten males, selected at random, measure as follows : wing, 2.70-2.92 in., averaging 2.80;

tail, 1.95-2.22, averaging 2.17; exposed culmen, .45-.54, averaging .49. In the female the wing averages 2.70 and the tail 1.97.

21. Vireo olivaceus (Linn.).—With the preceding are two examples that must be referred to *V. olivaceus*, a male taken Dec. 21, 1882, and a female, Feb. 14, 1883. In neither size nor color can they be distinguished from average specimens from the United States. These two specimens measure as follows: wing, ♂, 3.18, ♀, 3.21; tail, ♂, 2.22, ♀, 2.28; exposed culmen, .50—the same in both specimens.

22. Cyclorhis viridis (Vieill.).—The series of nearly 50 specimens of this species has been made the subject of a special paper (*cf.* this Bulletin, Vol. II, No. 3, pp. 123-135, June, 1889).

23. Hirundo erythrogastra (Bodd.).—Corumba, 3 specimens, March 23, 1886. The chestnut band on the forehead is a little narrower and the bill slightly smaller than in average examples from North America, but they are not otherwise different. The gloss of the upper parts is the same as in the North American bird.

The generic name *Chelidon* Forster, 1817, proves to be a pure synonym of *Hirundo* Schäffer (ex Linn.), 1774, as shown by Reichenow (Journ. für Orn., 1889, p. 187).

24. Progne tapera (Linn.).—The specimens of this species, 15 in number, were taken as follows: Chapada, September, 5; October, 1; November, 4; January, 1; Corumba, 2, Dec. 1, 1883, and April 1, 1886; Uacuryzal, 2, Feb. 16, 1886.

25. Progne domestica (Vieill.).—Three specimens (♂ ad., ♂ juv., ♀ ad.), Chapada, Sept. and Oct., 1882.

26. Atticora cyanoleuca (Vieill.).—One specimen (♂ ad.), Chapada, Sept. 10, 1885.

27. Atticora fucata (Temm.).—Two specimens (♂ and ♀ ad.), Chapada, Aug. 31 and Sept., 1883.

28. Daenis speciosa (Wied.).—Chapada and Corumba, 7 specimens (5 ♂ and 2 ♀), February, April, July, and August. These specimens measure as follows: wing, 2.15-2.40 in., averaging 2.22; tail, 1.50-1.75, averaging 1.63; exposed culmen, .36-.39, averaging .38. There is apparently no sexual difference in size.

29. *Dacnis cayana* (Linn.).—This species is represented by 132 specimens, taken as follows: January, 5; February, 11; March, 4; April, 38; May, 14; June, 6; July, 13; August, 13; September, 8; October, 9; November, 2; December, 4; without date, 5. Of this number 38 are adult males in breeding livery, 14 are young males in transition plumage, the remaining 80 being either females or young males indistinguishable from females in plumage. The young males in particolored plumage have the wings and tail black, and the body plumage variously mixed; a very few blackish feathers on the throat and interscapulum, and a few blue feathers scattered throughout the ventral surface.

Three December specimens are very young birds, still partly in nestling plumage, which is like that of the female, only the colors are all duller and paler.

A series of 20 adult males gives the following measurements: wing, 2.64–2.76 in., averaging 2.71; tail, 1.74–1.90, averaging 1.79; exposed culmen, .48–.55 averaging .51. A series of 10 adult females gives the following: wing, 2.52–2.79, averaging 2.63; tail, 1.56–1.90, averaging 1.76; exposed culmen, .50–.54, averaging .51.

The Chapada birds agree almost exactly in color with specimens from Bahia and other parts of eastern Brazil. Cayenne and Bogota skins are darker and less greenish, being, as would be expected, intermediate between the specimens from southern Brazil and the still darker Panama phase, described by Mr. Lawrence as *D. ultramarina*.

30. *Arbelorhina cyanea* (Linn.). (*Cæreba cyanea* auct.)—The series of 60 specimens (41 ♂, 19 ♀) of this species was taken as follows: January, 3; February, 4; March, 2; April, 2; August, 13; September, 23; October, 11; November, 2. There are no specimens taken between April 11 and August 22, nor between November 5 and January 17, the period of abundance being apparently from about August 20 to October 10. The only specimens not in fully adult plumage are four males, dated as follows: Sept. 13, Jan. 17, Feb. 14, and Feb. 21 (two). Two of these show merely traces of the immature plumage, and two are in a patchy condition in which about one-half of the plumage is that of

the adult male and the rest that of the female. One has the wings and the tail black, with the rest of the plumage as in the female, except that the lesser wing-coverts are mixed blue and green, with small patches of blue on the sides of the lower back and single blue feathers scattered here and there.

A series of 15 adult males, selected at random, measure as follows: wing, 2.57-2.76 in., averaging 2.68; tail, 1.46-1.68, averaging 1.58; exposed culmen, .48-.59, averaging .54. A series of 10 adult females presents the following: wing, 2.50-2.62, averaging 2.56; tail, 1.45-1.61, averaging 1.53; exposed culmen, .60-.64, averaging .62. Thus while the female is the smaller bird, the bill is absolutely considerably longer.

An egg of this species, taken with the parents, Oct. 13, 1882, is white spotted with pinkish vinaceous, rather sparingly except over the larger end, where the spots cover about two-thirds of the surface. It measures .75 x .55.

31. *Cœreba chloropyga* (Cab.). (*Certhiola chloropyga* auct.)—

This species is represented by 4 specimens from Abrilonga, 1 from Cuyaba, and 72 from Chapada, a total of 79, taken as follows: January, 4; February, 6; March, 7; April, 21; May, 2; June, 1; July, 11; August, 8; September, 11; October, 3; November, 3; December, 2.

Males and females are apparently indistinguishable in color, but in size the females are slightly the smaller. Apparently at least two years are necessary for the acquisition of the fully adult plumage. In young birds the upper plumage is dull brown, more or less strongly tinged with olive, the head concolor with the back; throat dull grayish white, faintly cross-barred with black, and stained faintly with buffy olive; rest of the lower surface pale dull greenish with the flanks and crissum more or less buffy; outer tail-feathers with the white spots wholly obsolete or only slightly indicated. Birds in this phase of plumage occur throughout the year.

About one specimen in ten of the adults shows a slight trace of white beyond the primary wing-coverts, but only in about one in twenty is it distinct enough to readily attract attention. Compared with Bolivian and Bahia specimens the latter are darker and the bill slenderer, the Chapada series being of a more oliva-

ceous brown above with a rather stouter bill, which, however, varies much in size in different specimens. It is difficult to find a specimen in the whole Chapada series as dark as average skins from Bahia, Cayenne, or northern Bolivia, the duller, more olivaceous brown of the back in the Chapada bird being thus a noticeable feature. Probably the bird of the Campo district of southwestern Brazil will prove separable from the bird of the coast and Amazonian regions as at least a well-marked geographical race.

A series of 10 adult males and 10 adult females measure as follows: *Males*: wing, 2.26–2.42 in., averaging 2.35; tail, 1.32–1.50, averaging 1.41; exposed culmen, .49–.51, averaging .50. *Females*: wing, 2.10–2.27, averaging 2.17; tail, 1.14–1.38, averaging 1.26; exposed culmen, .46–.50, averaging .48.

32. *Procnias viridis* Ill.*—This species is represented by a series of 59 specimens, all collected at Chapada, as follows: January, 3; February, 1; March, 3; July, 1; August, 24; September, 14; October, 7; November, 6. The period from March 26 to July 29 is unrepresented, during which time the species is probably absent from the vicinity of Chapada. Apparently every phase of plumage is represented, from the nestling to the adult. Of the 59 specimens 23 are fully adult males, 19 are adult females, and 28 are immature males in various phases of plumage.

The March specimens have apparently just completed a full molt, the outer primaries still retaining the sheaths at the base of the quills. No other adult shows signs of molting. A single nestling (labeled by the collector, ♂ juv., Nov., 1882) has the quills only about half grown, but the coloration is that of an adult female, showing that the first plumage is like that of the female. Young males of probably the second year are part-colored, having usually more or less black on the throat, while the blue of the adult plumage is distributed in irregular patches. Sometimes the whole throat is black while the general plumage is still that of the female; again there may be very little or no black on the throat while the general plumage is strongly mixed with blue. At least two, and possibly three, molts take place before the males acquire their fully adult livery.

The females are slightly smaller than the males, as shown by the following measurements of ten specimens of each sex: *Males*:

* See this Bulletin, Vol. II, No. 2, p. 69, March, 1889.

wing, 3.37-3.70 in., averaging 3.56; tail, 2.25-2.33, averaging 2.30; exposed culmen, .35-.39, averaging .36. *Females*: wing, 3.34-3.60, averaging 3.46; tail, 2.05-2.38, averaging 2.24; exposed culmen, .36-.40, averaging .38.

33. *Euphonia chlorotica violaceicollis* (Cab.).—Represented by 81 specimens, collected as follows: January, 8; February, 13; March, 0; April, 5; May, 4; June, 2; July, 9; August, 20; September, 12; October, 7; November, 1; December, 0. The specimens taken from May to November, including both these months, are all in adult breeding plumage; of those taken in January, not one is a male in full breeding dress, 4 being males in transition plumage, and 4 females; of the February specimens one is an adult male, 9 are males in transition plumage, and 3 are females; of the 5 April specimens, 2 are adult males, 2 are young males just acquiring full dress, and one is a female. It would thus seem that birds of the year acquire full breeding dress at the second molt; it also looks very much as though the black and yellow livery was worn only during the breeding season. The males in transition plumage show that the molt begins in December, and is not fully completed till April; while a few have completed the molt as early as February, or even in January, others are molting as late as April.

In the adult males there is some variation in the depth of the yellow of the lower parts and the intensity of the violet-purplish sheen of the back and throat, due perhaps to age. In all the large blotch of white on the two external tail feathers is well developed, and there is generally a very narrow line of black at the base of the forehead, nearly as well marked in some examples as it is in *E. affinis* of Central America.

Unfortunately I have no specimens of the *E. chlorotica* group from other parts of South America for comparison with the present fine series from Chapada.

A series of 20 adult males measures as follows: wing, 2.14-2.34 in., averaging 2.20; tail, 1.15-1.36, averaging 1.24; exposed culmen, .28-.33, averaging .30. A series of 10 adult females gives the following: wing, 2.06-2.19, averaging 2.13; tail, 1.18-1.29, averaging 1.22; exposed culmen, .28-.33, averaging .30.

34. *Euphonia lanirostris* Lafr. & d'Orb. — Abrilongo, 4 specimens; Chapada, 29 specimens, taken as follows: February, 4; March, 3; April, 14; May, 3; June, 1; July, 1; August, 4; September, 1; December, 1. Of these three are fully adult males; one is a male (Feb. 1), with a few traces of the immature plumage still left; 13 are young males in the garb of the female, but showing traces of the adult livery, in the markings of the head; 10 are apparently females. The young males in transition plumage were collected in March, April, May, July, August and September.

The measurements of 6 adult males and 6 adult females are as follows: *Males*: wing, 2.44–2.57 in., averaging 2.50; tail, 1.34–1.50, averaging 1.37; exposed culmen, .36–.39, averaging .37. *Females*: wing, 2.28–2.46, averaging 2.34; tail, 1.23–1.36, averaging 1.31; exposed culmen, .34–.38, averaging .35.

This species differs from *E. crassirostris* Scl., from northern South America, in being much larger, with the yellow of the lower parts a much deeper (orange) yellow, and the cap deeper yellow and larger. It has a shorter, more triangular, and very differently shaped bill. The two forms are apparently specifically distinct, although united by Messrs. Salvin and Godman (Biol. Centr.-Am., Aves, I, p. 262). Mr. Sclater, however, has since (Cat. Bds. Brit. Mus., XI, p. 77) called attention to the desirability of the comparison of further material "before the absolute accuracy of this proceeding can be substantiated." Our material shows that Mr. Sclater's suspicion that the two forms might prove distinct was well founded.

35. *Pipraeidea melanonota* (Vieill.).—Two specimens, both females, June 2, 1882, and July 21, 1883. Apparently a rare bird at Chapada.

36. *Calliste margaritæ*, sp. nov.

Male Adult.—Above similar to *C. cayana*; below similar to *C. flava*. Cap shining coppery rufous; rest of upper surface shining ochraceous rufous; wings and tail blackish edged with bluish green; sides of head, chin, throat, breast, and middle of belly black; rest of lower surface strong ochraceous rufous, much deeper than the color of the back. Bill blackish brown, lower mandible much lighter than the upper; feet blackish. Wing, 2.93; tail, 2.06; bill, .43.

Female Adult.—Cap deep ochraceous; rest of upper surface pale green with a yellowish sheen, the rump more fulvous than the back; wings and tail blackish edged with bluish green; sides of head, chin, throat, and breast dull greenish gray with a slight wash of yellowish; flanks and crissum ochraceous, deepest on the latter.

As already stated, this species curiously combines the characters of *C. cayana*, which it almost exactly resembles in the dorsal plumage, with those of *C. flava*, from which it is indistinguishable when seen from below.

Named in honor of Mrs. H. H. Smith, to whose untiring energy in the field we are largely indebted for the immense series of Chapada birds forming the subject of the present paper.

This species, fortunately, is represented by a series of 137 skins, showing the changes of plumage due to sex, age, and season, and also by well-identified eggs. The series of skins includes 50 males in adult plumage, 30 young males in various intermediate phases of plumage, 56 adult females, and one young bird (Nov.) in first plumage. The record by months is as follows: January, 10, all in molt; February, 3, one (♂ juv., Feb. 5) only in molt; March, 8, none in molt; April, 35, none in molt; May, 18; June, 2; July, 4; August, 15; September, 12; October, 14; November, 10; December, 6. Three adult males, taken Dec. 6 and 12, are just beginning to molt.

Several of the October and November birds are accompanied by nests and eggs.

From this series it would appear (1) that there is only one molt, which begins early in December, is at its height in January, and is mostly finished before the end of February; (2) that males in transition plumage occur throughout the year, and that (3) consequently the adult male plumage is not acquired till at least the second year, and possibly not till the third, the young males presenting apparently two distinct phases of plumage; (4) that the breeding season is mainly limited to the months of October and November.

The single bird of the year ("Dec., 1882") resembles in a general way the adult female; it is, however, much lighter (dull buffy white faintly streaked with olive gray) on the throat and breast, with the whole top of the head only slightly more rufescent than

the back. In the next stage the young males are just intermediate between the female and the adult male: the throat and breast is more or less blackish, most of the feathers being black beneath the surface and heavily edged with gray, the black showing through more or less strongly in patches; the flanks are dull ochraceous olive; the top of the head is deep shining bronzy ochraceous, in strong contrast with the rest of the dorsal surface, which is pale shining yellowish fulvous, mixed with greenish, thus very different from the duller yellowish green of the female, or the deep clear fulvous yellow of the adult male. At a still more advanced stage the head and throat are as in the adult, but the back is more greenish, and the black extends only to the upper breast, where it is much obscured by greenish gray, while the lower breast and abdomen are simply dusky greenish gray. As these two stages are not sharply defined it is impossible to say whether they result simply from individual variation or whether two years are required by the males to obtain the fully adult livery; the latter, however, seems the more probable.

The females also present two well-pronounced phases of plumage, both occurring throughout the year. In the first or younger stage the throat and breast are concolor,—dull olive gray with a slight buffy gloss, passing into olive buff on the flanks and lower breast, ochraceous on the middle of the abdomen, and brownish ochraceous on the crissum; above bronzy green with a faint sheen of fulvous; cap dull ochraceous brown with a greenish lustre. In the second or older stage the throat approaches a dull bluish green gray with faint indications of blackish shaft streaks; the lower breast is darker than in the first stage, and the rest of the lower surface less ochraceous; above the plumage is bluish green with a strong sheen of fulvous, and the cap is deep ochraceous rufous.

Fully adult birds, 10 males and 10 females taken at random, measure as follows: *Males*: wing, 2.84–3.03 in., averaging 2.93; tail, 1.86–2.22, averaging 2.06; exposed culmen, .42–.46, averaging .43. *Females*: wing, 2.70–2.90, averaging 2.80; tail, 1.92–2.17, averaging 2.02; exposed culmen, .41–.46, averaging .43.

This species is represented by three eggs—two of one set and one of another—taken with the parent birds respectively Oct. 28

and Nov. 29. The two taken on the latter date were much advanced in incubation and are more or less broken. One of them measures .85 x .53 in. The ground color is pale lavender, and the whole surface is thickly spotted all over with two shades of lilac brown, but most heavily over the larger end, where on one of them are a few larger spots of bistre. The third egg is perfect and measures .85 x .60, being much thicker in proportion to its length. It is also so heavily spotted that the whole surface is nearly covered with the markings, which are of a lighter and more reddish brown than in the other set.

37. *Tanagra sayaca* (Linn.) (= *T. sayaca* + *T. cyanoptera* auct.).—Represented by 132 specimens, taken as follows: January, 12; February, 11; March, 14; April, 23; May, 13; June, 6; July, 8; August, 10; September, 15; October, 13; November, 3; December, 2; without date, 2. Eggs accompany several of the October and November specimens. The molt appears to begin early in January and to continue into March.

The series presents quite a range of variation in color, which, according to the sexing of the specimens by the collector, is not closely correlated with either sex or season, but may depend upon age. Of the 132 specimens 60 are sexed ♂, and 64 ♀, 12 being unmarked for sex. When arranged according to sex, the two series present no appreciable difference in coloration. About one-half of either sex show no olive green in the plumage, either above or below; nearly another half present an olive green shade throughout most of the upper plumage (strongest on the rump), and a strong wash of the same tint across the breast, along the flanks, and over the crissum. A much smaller proportion, about one-fourth of the whole, are variously intermediate, obviously in many cases in a transition stage between the two phases. Several of the green birds appear to be unquestionably birds of the year, and the transition from the green to the blue phase seems clearly due to age, the blue birds being fully adult, the green ones partly birds of the year and partly birds of the second year. As already intimated, both phases occur throughout the year.

The bluish gray birds are indistinguishable from Bahia specimens (hence *T. sayaca* auct.), while the birds with a greenish tinge agree with the so-called *T. cyanoptera*. Unfortunately I

have not a large series of birds from eastern Brazil, which would prove of great importance in the present connection.

Measurements of a series of 40 specimens—10 adult males, 10 adult females, 10 young males, and 10 young females—show that the females average a very little smaller than the males, and that the young are smaller than the adults, in this case the young birds being apparently birds of the second year, before the molt, while the adults are all in very high plumage and presumably three years or more old. These measurements may be summarized as follows:

	WING.	TAIL.	EXPOSED CULMEN.
10 ♂ ad. (3.54-3.70)=3.60		(2.42-2.68)=2.50	(.48-.57)=.53
10 ♀ ad. (3.40-3.62)=3.50		(2.43-2.58)=2.47	(.48-.54)=.51
10 ♂ juv. (3.32-3.62)=3.40		(2.32-2.48)=2.41	(.48-.54)=.51
10 ♀ juv. (3.32-3.54)=3.38		(2.26-2.51)=2.39	(.47-.55)=.51

The collection contains three eggs of this species, belonging to two different sets, taken, with the parents, Oct. 7 and 17, 1882. They measure .90 x .64 in., .88 x .67, .96 x .67. The ground color is dull grayish white, profusely spotted with dots and blotches of drab brown, overlaid here and there, but particularly at the larger end, with sharp splashes and streaks of blackish brown.

38. *Tanagra palmarum* Wied.—Represented by 64 specimens, taken as follows: January, 7; February, 7; March, 3; April, 8; June, 4; July, 6; August, 6; September, 12; October, 6; the months of May, November, and December being unrepresented.

The variation in color in the present series is exactly parallel to that noted above in *T. sayaca*. Three distinct phases of plumage are represented, but they present no correlation with either sex or season. Of the 64 specimens 20 are in fully adult plumage, and consist of about an equal number of males and females, according to the sex marks on the labels. Of the remaining 44 specimens—consisting also of a nearly equal number of males and females—a few are evidently (from the texture and softness of the plumage) birds of the year, a few of which (January and February specimens) are molting into the second phase, which embraces nearly two-thirds of the whole series. The first plumage is nearly uniform dingy grayish brown, with a slight wash of dark olive [September, 1891.]

green. The second plumage is yellowish olive green below, and brownish olive green above, lighter and more yellowish on the lower back, and paler, bluish green on the anterior half of the top of the head, without any very distinct lustre anywhere. The adults are darker throughout, with a distinct purplish gloss over most of the body plumage, much stronger in some specimens than in others, with the head (especially the whole crown) light delicate green, which has a bluish cast on the lores and chin. The preceding phase grades into this by a direct molt, but also almost insensibly by individual variation. It thus seems evident that the birds showing a distinct purplish gloss are at least two years old, while those in highest plumage are doubtless still older. The majority of the birds in highest lustre are males, so that in fully mature birds the males appear to average brighter than the females.

Measurements of 20 specimens—5 adult males, 5 adult females, 5 young males, and 5 young females—show the males to be slightly larger than the females, and the young birds in second plumage to be considerably smaller than old birds in high plumage. The following is a summary of these measurements:

	WING.	TAIL.	EXPOSED CULMEN.
5 ♂ ad. (3.77-4.12)=	3.95	(2.75-3.10)=2.97	(.50-.57)=.53
5 ♀ ad. (3.69-3.94)=	3.75	(2.66-3.02)=2.86	(.52-.57)=.53
5 ♂ juv. (3.67-3.80)=	3.72	(2.60-2.96)=2.78	
5 ♀ juv. (3.60-3.71)=	3.65	(2.61-2.92)=2.76	

39. *Ramphocelus astrosericeus* Lafr. & d'Orb.—Represented by 111 specimens, of which 54 are adult males, 44 adult females, 10 young males in transition plumage, and 3 birds in first plumage (November specimens).

The different months of the year are represented as follows: January, 11; February, 6; March, 9; April, 10; May, 12; June, 2; July, 7; August, 16; September, 3; October, 14; November, 13; December, 21; without date, 4. The January and February and the earlier March specimens are in molt. Young males in transition, patchy plumage seem to occur throughout the year, specimens in this condition having been taken in January, May, August, October, and November. Three November specimens are in first plumage.

The birds in first plumage resemble in color very dull-colored females, but the plumage has the soft, fluffy character distinctive of newly-fledged birds. Males in adult plumage vary somewhat in brilliancy, and in the extension of the red upon the breast and head; in some it is confined to the upper breast, and that of the head does not pass below the nape; in others it covers the lower breast and even extends to the flanks, and above tinges a portion of the interscapulars. The females vary below from a dull somewhat yellowish brick red to a deep intense dark brick red, which color extends as a strong surface wash over the whole throat and back. These variations obviously depend upon age, and are closely parallel with those of *Tanagra sayaca* and *T. palmarum*.

Two eggs of this species, taken Nov. 6, 1882, measure .93 x .65 and .92 x .67. They are light blue, rather sparingly dotted and blotched with blackish brown, with a few paler spots of lavender, the markings more or less circular, some of them drop-shaped.

40. Piranga saira (*Spix*).—Represented by 40 specimens—16 adults males, 3 males in the livery of the female, 6 males in transition plumage, 13 adult females, 2 females in first plumage—taken as follows: January, 3; February, 1; March, 0; April, 1; May, 5; June, 1; July, 4; August, 2; September, 10; October, 1; November, 6; December, 6.

The species is rare, and this large series was obtained by special quest of the bird.

Young in first plumage are greenish gray above, narrowly streaked with dusky; below pale yellowish white, more broadly streaked with dusky. The young of both sexes molt in November and December into the plumage of the female. The next stage is a mixed transition plumage of red and green above and red and yellow below, the proportion of red and green or yellow feathers varying with the stage of the molt. The adult male livery is evidently not always fully acquired by a single molt, as shown by males taken in September in particolored plumage, with males in fully adult plumage and males still wholly in the dress of the female. The adult males do not apparently resume the livery of the female, as is the case with some of the North American species of the genus, as January adult males are molting from a worn, faded red plumage into a fresher, brighter red dress.

41. *Eucometis albigollis* (Lafr. & d'Orb.).—This species is represented by a series of 55 specimens, showing all phases of plumage from the young bird just from the nest to breeding adults. This series may be classified roughly as follows: adult males, 22; adult females, 15; young birds partly or wholly in first plumage, 3; more or less immature (in various conditions of plumage), 15. The various months of the year are represented as follows: January, 5 specimens; February, 4; March, 11; April, 2; May, 6; June, 1; July, 4; August, 2; September, 4; October, 1; November, 9; December, 6.

Mr. A. E. Smith informs me that this species is not of common occurrence at Chapada, and this large series is due to special efforts, the bird being sought for especially on account of its showy colors.

A young bird taken Dec. 1, still mostly in first plumage, is dull olive brown above with a tinge of ochraceous, including all the wing-coverts, the greater of which are broadly edged with ochraceous; quills dull olive green; below buffy ochraceous, lighter on the middle of the body and darker (brownier) on the sides, the feathers of the breast centred slightly with dusky. In this specimen the greater part of the head has molted into a dull green, and dull green feathers are mixed through the interscapulium, while dull buffy yellow feathers are appearing on the throat and breast. A second specimen, taken Feb. 14, is rather more advanced in molt, but still retains much of the first plumage. A third specimen, though taken Jan. 3, is much more advanced than the last, while a fourth, taken Dec. 1, has nearly fully acquired the second plumage. Hence apparently the breeding season is considerably protracted, beginning early in October, and continuing till into November.

In the second plumage the head is deep yellowish green, like the rest of the dorsal surface; the throat and breast are pale greenish yellow, passing into deep yellow over the lower breast and the lower surface generally. At this stage the bill is black, instead of horn color above and light beneath as in adults.

The regular molt appears to extend over a long period, molting birds occurring from November till May. The adults appear to molt slowly and somewhat irregularly from November till Feb-

ruary, and the young birds (birds of the preceding year) from February to May. In newly-molted adults (January, February, and March specimens) the cap is pure cinereus; later in the season (April to November) the cap is olive brown gray, the crest often lightening to a lustrous pale fulvous gray. Apparently this last change takes place without a molt.

Birds of the year appear to molt later than adults, specimens molting from the yellow throat and green head of the second plumage into the buffy white throat and ashy gray head of the adult occurring only from February to May (Feb. 21 to May 23), with the single exception of a specimen taken Dec. 21. In some specimens this change takes place most rapidly on the throat, in others on the head, so that specimens occur having only a few yellow feathers left in the throat while the head is still green flecked with gray, or the reverse, the head having become nearly all gray while the throat is still yellow flecked with white. At the same time a general molt, including wings and tail, is in progress.

From the material in hand there is apparently very little sexual difference in either color or size. The males average slightly larger, and seem to have the crest a little longer and fuller, with more of the silvery fulvous lustre. The full dress appears to be acquired the second year, or with the third molt.

In adults the length of the wing varies from 3.35 to 3.65 in., averaging 3.50; the length of the tail ranges from 3.20 to 3.50, averaging about 3.30.

42. *Tachyphonus rufus* (Bodd.).

Tangara noir, d'Amerique, DAUB. Pl. Enl. 179, fig. 2 (♂).

Tangara albirostris BODD. Tabl. Pl. Enl., 1783, p. 11 (*nec* LINN.), based on the above.

Tangaroux, de Cayenne, DAUB. Pl. Enl., 711 (♀).

Tangara rufa BODD. Tabl. Pl. Enl., 1783, p. 44.

"*Oriolus melaleucus* SPARRM. Mus. Carls. 1787, No. xxxi."

Tachyphonus melaleucus auct. recent.

The earliest name for the species of late commonly known as *Tachyphonus melaleucus* is *Tangara rufa* Bodd., based on Daubenton's plate as above cited.

This abundant species is represented by 148 specimens—100 ♂ ad., 40 ♀ ad., 2 ♂ juv., 6 juv. in first plumage—taken as

follows: January, 11; February, 5; March, 15; April, 14; May, 21; June, 13; July, 16; August, 15; September, 7; October, 12; November, 10; December, 9.

Young birds in first plumage (taken in November and December) are like the adult females in coloration, but the plumage is lax and soft. The only birds in particolored plumage are two males taken in March, one of which has acquired about half of the adult plumage, the other rather less. A few March, April, May, and October males also retain a few feathers of the immature plumage.

The molt extends from January to April, but is at its height in February; most March specimens, and nearly all taken in April are in perfect high plumage, but a few of the latter were still in molt.

Two sets of eggs, consisting respectively of two and three each, and taken Oct. 3 and 12, 1882, are brownish white with prominent isolated dots and streaks of bistre and brownish black, with finer half-concealed shell markings of pale lavender. The two sets measure as follows: (1) 1.02 x .68 in., 1.01 x .68; (2) .95 x .73, .94 x .74, .95 x .73. One of the labels gives the place of the nest as "In coffee tree, in garden, seven feet from ground."

43. *Cypsnagra ruficollis* (Licht.).—Represented by 57 specimens, of which 27 adults are sexed as males, 13 adults as females; 10 in immature plumage are marked males and 3 females, while 4 are unmarked for sex. The months of March, June, and October are unrepresented, the specimens having been taken as follows: in January, 7; February, 7; April, 2; May, 2; July, 4; August, 6; September, 7; November, 7; December, 8.

There is apparently no sexual difference in coloration or size. Freshly-molted adult birds are frequently tinged with buff below, and have more or less ashy bordering the feathers above; the buff gradually fades to soiled white and the ashy edgings wear away, leaving the black of the upper parts deep glossy black. Birds in immature plumage appear to occur throughout the year; in these the back is ashy brown more or less tinged with olive and streaked broadly with blackish; the lower parts are strongly washed with yellowish buff, and the throat is much paler rufous than in the adults. Others are dull brownish black above, patched with new

black feathers. Birds in these plumages are probably birds of the preceding year. Birds of the year (one specimen, Dec. 19) are similar, but with the plumage more fluffy and softer. The fully adult plumage appears to come in at the third molt.

44. *Nemosia pileata* (Bodd.).—Chapada, 2 specimens, ♂ ad., July 24, and ♀ ad., Aug. 4, 1883; Corumba, 4 specimens—♂ ad., Nov. 29, 1883; ♀ ad., Dec. 5, 1883; ♂ juv., April 4, 1886, and ♀ ad., April 8, 1886. The November specimen is in exceedingly worn plumage. The young male is faintly tinged on the throat with ochraceous, but much less so than in the females; the black area of the head in the adult male is mixed blackish and blue.

45. *Nemosia guira* (Linn.).—Of the 33 specimens of this species 16 are adult males, 13 adult females, and 2 young males in transition plumage. Each month of the year, except March, is represented by from 1 to 7 specimens.

Young males appear for a time to resemble the females. Males of the second year are in transition plumage. Thus a male, taken April 2, differs from the female in having the lower back reddish orange, but the patch is much more restricted and paler than in the adult male; the throat shows a mixture of black feathers, and the breast is mixed reddish orange and yellow. Another, taken July 20, is similar, but with more black on the throat and more orange on the breast.

46. *Thlypopsis sordida* (Lafr. & d'Orb.).—Represented by 19 specimens taken in January (3), May (1), June (3), July (1), August (2), September (3), October (3), and November (3); December, February, March, and April being unrepresented. No specimens were taken between Jan. 30 and May 26, during which period the species is probably absent at Chapada, and from the smallness of the series is probably at no time abundant. Of the 19 specimens 8 are sexed male, 7 female, 3 "♂?", and 1 "♀?". The series includes 5 young birds—4 males and 1 female—taken 1 in January, 3 in June, and 1 in October.

A freshly-molted January adult male is everywhere heavily washed below with brownish ochraceous, except on the throat, which is deep yellow, and the middle of the abdomen, which lightens to whitish. The other adults are pale ochraceous below,

strongest across the breast and on the flanks. A January ♂ juv. is deep olive green above, with a few orange red feathers appearing on the forehead; below, throat deep yellow, passing into paler yellow over the whole breast and middle of the abdomen, the flanks and crissum deep buff washed with yellow. A June "♂?" resembles the last, except that the colors are everywhere paler, and the back is mixed with the ashy brown feathers of the adult. An October male is like the June specimen, except that there is a large patch of orange red feathers on the top of the head, and scattered feathers of the same color over the hind head.

47. *Arremon polionotus* Bon.—The series of this species consists of 77 specimens—41 ♂ ad., 3 ♂ juv., 31 ♀ ad., and 2 ♀ juv.—and represents each month of the year, collected as follows: January, 3; February, 5; March, 6; April, 6; May, 8; June, 13; July, 2; August, 10; September, 7; October, 11; November, 5; December, 1.

In the fully adult male in high plumage the whole cap is black; in many males, however, apparently otherwise in fully adult plumage, the posterior border is divided by a broad ashy patch extending up from the nape; in some it barely reaches the crown; in others it reaches the middle of the crown, and in still others forms a well-defined median ashy stripe extending to the forehead, and even occasionally to the base of the bill. In these latter, however, there are generally a few greenish feathers scattered through the interscapulum, showing that such examples are comparatively young birds. The same tendency to a division of the crown by an ashy median band is traceable in many of the adult females.

This species is rare in collections, and the female has not as yet been well described.

Male Adult.—Above deep plumbeous; whole top and sides of the head and nape deep pure black, with the gray of the back dividing the black on the middle of the nape, and often extending forward to the top of the head, and occasionally to the base of the bill as a well-defined median stripe; superciliaries, beginning over the eye, white; wings and tail blackish, the feathers more or less edged with the color of the back; all of the external wing-coverts light olive green, becoming lighter or yellowish olive green on the lesser coverts; bend of the wing deep bright yellow; below pure white, with a narrow black pectoral

collar, and the flanks ashy; top of the upper mandible black, rest of the bill yellow.

Adult Female.—Above olivaceous brown, with generally a decided tinge of ashy; head brownish black, the cap usually divided by a median stripe of olivaceous ashy, sometimes wanting but generally present; superciliaries and pectoral band as in the male; wings and tail as in the male, but duller and browner; below, throat, breast, and sides of abdomen soiled buffy white; middle of abdomen nearly pure white, flanks pale brown. In young birds the buffy wash below deepens to pale olivaceous, and the back is more distinctly olivaceous.

Unfortunately there are no birds wholly in first plumage, but traces of it (or perhaps of the second) are seen in molting birds, taken in February, March, April, and May, in which are seen vestiges of a former plumage of dull greenish brown on the sides of the head and hind neck, and of bright olive green on the back.

The females are considerably smaller than the males, as indicated by the following measurements of 10 adults of each sex: *Males*: wing, 2.90–3.26 in., averaging 3.04; tail, 2.45–2.70, averaging 2.55; exposed culmen, .52–.58, averaging .54. *Females*: wing, 2.67–2.93, averaging 2.78; tail, 2.27–2.45, averaging 2.40; exposed culmen, .53–.62, averaging .57.

Two eggs of this species, taken with the parent bird Oct. 21, 1882, are much elongated in form, measuring .95 x .62 in. and 1.00 x .60. The ground color is creamy white, finely spotted with rusty brown, sparingly over the smaller end, thickly and heavily over the larger end, where the brown spotting nearly conceals the ground color. One of the eggs has shell markings of deep lavender brown.

48. *Arremon silens* (Bodd.).—The 8 specimens representing this species consist of 4 adults (3 ♂, 1 ♀) and 4 young birds in first plumage, taken as follows: January, 1 (“♂ juv.”); February, 2 (♂ ad., ♀ ad.); March, 2 (♂ ad., “♀ juv.”); June, 1 (♂ ad.); November, 2 (“♂? juv.,” “♀? juv.”). From this it would seem that the species breeds over a long period,—at least from October till April.

The youngest specimen (wings and tail not fully grown) was taken March 16. Above it is nearly uniform dull brownish olive green; below, the throat is whitish streaked with dull dark greenish brown; breast olive greenish brown, faintly streaked

with lighter; flanks brown washed with greenish; rest of lower parts dull whitish streaked with darker (olive brown tinged with yellowish). A second specimen (taken Nov. 22) is slightly older, but still similar with here and there the new bright feathers of a more advanced plumage coming in. A third (taken Jan. 1) is similar, but a little more advanced, the dark patches on the sides of the head being well outlined. The fourth (taken Nov. 30) is still further advanced in molt, changing into the garb of the adult female on the throat, breast, and head.

An adult male, taken March 31, has about two-thirds completed the regular molt.

49. *Saltator maximus* (Müller).

Tangara, des grands Bois de Cayenne, DAUB. Pl. Enl. 205.

Tanagra maxima MÜLLER, Syst. Nat. Suppl. 1776, p. 159. (Based on the above.)

Tanagra magna GMELIN, Syst. Nat., I, 1788, p. 890. (Based on Pl. Enl. 205.)

Saltator magnus BON. et auct. recent.

Of the 32 specimens representing this species 12 are adult males, 16 adult females, 2 young males, and 2 are not marked for sex. It is probably a resident species at Chapada, although the months of March and December are unrepresented in the series.

The sexes are apparently not externally distinguishable. The January specimens are beginning to molt; in the February specimens the molt is well advanced. Specimens in full plumage vary somewhat in the amount of cinereous on the head, it showing very little in some and in others extending across the occiput and showing through the thin veiling of green over nearly the whole top of the head.

Two young birds, taken respectively Nov. 30 and Feb. 28, are still partly in nestling plumage; the February example is, however, the younger of the two, showing that the breeding season covers a considerable period. Aside from the fluffy character of the first plumage, much of which is still retained, these birds differ from the adults in the much lighter color of the bill, and in a generally duller coloration. The green of the upper parts is a dark grass green instead of light yellowish green, as in the adults; the fulvous of the throat and crissum is also paler, and

the black stripes bordering the throat are narrower and less sharply defined.

None of the specimens presents even a trace of the black gorget distinctive of the nearly allied *S. magnoides*.

50. *Saltator similis* Lafr. & d'Orb.—This species is represented by 44 specimens—21 males and 23 females—all of which are in adult plumage except two. Each month of the year is represented, as follows: January, 1; February, 1; March, 5; April, 6; May, 3; June, 3; July, 4; August, 10; September, 5; October, 3; November, 2; December, 1.

The males and females are similar in coloration, but there is considerable seasonal variation, while the young are quite different from the adults. In all the lower back is cinereous, and the interscapulum, wing-coverts, and edges of the wing-quills are olive green, lightest on the quills; in adult birds the head and nape are nearly always more or less cinereous, sometimes with only a very slight wash of green, giving the effect of bluish green, but very few specimens have the head as pure gray as the rump; more frequently than otherwise the green prevails over the gray, and often almost wholly obscures the latter. This is particularly the case in freshly-molted birds, the green edging to the feathers wearing away and exposing the cinereous as the season advances. At the same time the strong buffy suffusion of the lower parts gradually fades to an obscure buffy gray.

Young birds differ from the adult in having the whole upper plumage, except the lower back and tail, dull olive green, and the lower plumage fulvous, the feathers of the upper breast broadly centred with dusky and washed with green, and those of the lower breast with prominent dusky shaft-stripes.

Eight eggs of this species represent parts of three different clutches, three of which were taken respectively Oct. 20, Nov. 10 and Dec. 4, 1882. The eggs are pale blue, with a narrow wreath of black, zizzag, variously interwoven lines, like narrow light pen strokes, mixed here and there with a heavier stroke. The eggs vary somewhat in form and size, the extremes measuring as follows: .95 x .76 in., 1.05 x .78, 1.00 x .72. An entry by the collector on the back of one of the labels reads: "Nest on low shrub, three feet from the ground, in thick forest."

51. *Saltator atricollis* Vieill.—The series of 46 specimens contains birds taken in every month of the year, as follows: in January, 4; February, 4; March, 7; April, 4; May, 1; June, 2; July, 8; August, 3; September, 5; October, 4; November, 2; December, 2. Of the 40 adults, 19 are sexed as males, 18 as females, and 3 are not marked for sex; of the 6 young birds 2 are marked males and 4 females.

Apparently the sexes are alike in plumage. A young bird with the quills half grown (♀? juv., Dec. 19) has the upper plumage dull brown, slightly ochraceous on the rump, and with the greater coverts and quills edged with brownish ochraceous. Below the plumage is dull soiled grayish white, the breast narrowly streaked with dusky, the flanks buffy ochraceous, and the crissum ochraceous rufous. In the next plumage the dorsal surface is chocolate brown, darker and not grayish brown as in the adult, and the lower surface is strongly ochraceous, with a yellowish wash across the breast; the dark area of the throat, forehead, and sides of the head is blackish brown instead of black as in the adult. Other young specimens (collected November to February) are in a transition stage between this and the adult plumage, in which the dark area of the head is spotted with black, etc.

52. *Diucopsis fasciata* (Licht.).—Judging by the material in hand, this is an abundant species at Chapada from October till February, and rare or casual during the remainder of the year. The 43 specimens were taken as follows: January, 4; February, 6; March, 0; April, 0; May, 1; June, 1; July, 1; August, 3; September, 1; October, 5; November, 5; December, 17. Of these 30—16 ♂ and 14 ♀—may be considered as in fully adult plumage, while 14 are young birds, representing various degrees of immaturity.

There is apparently no sexual difference in color, and little if any in size. The November and December adults are in faded, worn plumage, the brownish gray of the back strikingly contrasting with the pure cinereous of the August and September specimens. The molt appears to begin in some individuals in December, and is general in February. The single May specimen is in perfect, fresh plumage.

A single specimen in fluffy first plumage is brown (between hair brown and bistre) above, darker on the head and lighter on the lower back, the light wing-bar faintly indicated, and the ear-coverts scarcely darker than the top of the head; below ashy white, strongly tinged with pale yellowish olive over the throat, foreneck, and breast. The second plumage is similar but the colors are all stronger, the brown above being deeper in tone and varying in different specimens from olivaceous brown to olivaceous russet; below olive buff with a yellowish tinge over the middle of the ventral surface. The ear-coverts and the lesser and greater wing-coverts vary in different specimens from the general color of the upper surface to blackish. January specimens are molting from this phase into the adult plumage. Many of the adult (November and December) specimens retain traces of the second plumage, particularly above. The single June specimen (still in molt!) is in a transition plumage, about one-third of the plumage being adult and the remainder immature.

53. *Schistochlamys atra* (Gmel.).—Of the 51 specimens, 20 are adult males, 17 are adult females, 4 are young males, and 10 are young females. The series in immature plumage consists of birds in uniform olive green dress, and in various stages of transition from this to the fully adult. The different months of the year are represented as follows: January, 1; February, 3; March, 6; April, 11; May, 2; June, 1; July, 2; August, 7; September, 6; October, 1; November, 5; December, 2.

There is no specimen in first plumage, but five are in second plumage, taken as follows: March 5, April 6 (two); April 15, May 5, May 15, July 6. These are uniform dark olive green above, the feathers grayish beneath the surface, but the gray not usually showing unless the feathers are disarranged; below strong yellowish green, passing into greenish yellow on the middle of the abdomen; just below the surface the feathers are gray, which often shows through the more superficial green tint, particularly on the breast. One April specimen (♀, Apr. 29) shows little touches of black on the throat, where a part of the feathers have black bases, and the head is gray faintly washed with olive. An August specimen has the forehead, sides of the head, chin, and

upper throat about half black, with the rest of the plumage olive green, as in the series first described.

A second series of five specimens is in much worn green plumage, molting into the gray and black of the adult, in which the old and new feathers are mixed in varying proportions.

The series as a whole shows (1) that the yearling birds begin to molt in September and continue in molt till late in January; (2) that the olive plumage is worn for at least a year. Birds in adult plumage are in molt from November till late in February. Males and females are not, at any age, appreciable different in plumage.

Two eggs of this species, taken Sept. 22, 1882, measure 1.02 x .67 in., and .93 x .60. The yellowish white ground color is nearly covered with small more or less blended specks and dots of dark chocolate, quite covering the egg and deepening on the larger end so as to almost wholly conceal the ground color. The label states that the nest was "found on a low shrub close by running water in an open field."

54. *Guiraca cyanea* (Linn.).—Two females, Chapada, April 12, 1886, and August 8, 1882.

55. *Oryzoborus torridus* (Scop.).—Represented by 5 specimens—2 ♂ ad., 1 ♂ juv., 2 ♀ ad.—Chapada, March, June, July, and November.

56. *Oryzoborus maximiliani* Cab. — Three specimens, Chapada, May 17 and 22, 1883.

57. *Sporophila hypoleuca* (Licht.).—Two specimens, ♂ ad., Cachoeira, Jan. 29, 1886; ♀ ad., Corumba, March 1, 1886.

58. *Sporophila plumbea* (Wied). — Six specimens, 3 adult males and 3 adult females, taken one each in March, May, June, and September, and two in July.

59. *Sporophila melanocephala* (Vieill.).—Four specimens, Corumba, February and March, 1886—2 ♂ ad., 2 ♂ juv.

60. *Sporophila caerulescens* (Bonn. & Vieill.).—This apparently common species is represented by 34 specimens, of which 7 are adult males, and the rest young males and females. A few

of the young males were taken just as they were acquiring traces of the adult plumage, but the greater part are in a garb indistinguishable from that of the female.

61. *Sporophila gutturalis* (Licht.).—Represented by 12 specimens, only 3 of which are adult males. The months represented are April, May, July, August, and November. I find great difficulty in distinguishing young birds of this species from the young of *S. carulescens*, a number of which are only provisionally referred.

62. *Sporophila lineola* (Linn.).—One specimen, an adult male, Cachoeira, Jan. 29, 1886.

63. *Volatinia jacarini* (Linn.).—The 14 specimens representing this species consist of 6 adult males, 5 young males in various stages of plumage, and 4 adult females, taken in February, March, April, August, September, and October.

In all the under wing-coverts are white. The Chapada specimens, being true *jacarini*, differ from *V. splendens* not only in color, as various writers have pointed out, but in being considerably larger than the latter as represented in Yucatan and Guatemala.

64. *Phonipara fuliginosa* (Wied.).—Three specimens—1 ♂ ad., Nov. 14, 1882; 2 ♀ ad., July 29 and Aug. 31, 1885.

The female (apparently not before described) is grayish olive brown above, slightly grayer on the head and more olive on the rump; below olive gray, browner on the sides and lighter (whitish) on the middle of the abdomen. Hence the specimen from Pernambuco, mentioned by Mr. Sharpe (Cat. Bds. Brit. Mus., XII, p. 152) as probably an adult female of this species must, if a female, be referred to some other species.

65. *Paroaria capitata* (Lafr. & d'Orb.).—Corumba, February, March, and April, 1886, 10 specimens; Uacuryzal (50 miles north of Corumba), 3 specimens. Of these 13 specimens 6 are adult and 7 are young.

There is apparently no sexual difference in plumage. The young birds have the whole upper plumage blackish brown, including the wings and tail, except the head, which is of a much lighter coffee brown, forming a distinct hood; sides of the head,

chin, and sides of the throat, ochraceous, fading to buff on the throat; flanks and crissum tinged with buff. This is probably the first plumage, which is retained in part by most of the young birds of the present series, which are all in transition plumage. In most of them the brown quills of the wings and tail are being replaced by black ones; the back is partly black and partly brown; black feathers are coming in on the throat and red ones on the head. In all the bill is yellow or light yellowish brown, a little darker in the young birds than in the adult.

Contrary to my formerly expressed opinion (this Bulletin, II, p. 84), *P. capitata* is apparently quite distinct from *P. gularis*, of which the Museum has recently received a large series. On the other hand, *P. cervicalis* is evidently merely a subspecies of *P. gularis* (cf. l. c.).

66. *Coryphospingus cucullata* (Müll.).

Moineau, de Cayenne, DAUBEN. Pl. Enl. 181, fig. 1.

Fringilla cucullata MÜLLER, Syst. Nat. Suppl., 1766, p. 166. (Based on the above.)

Passer cristatus BODD. Tabl. Pl. Enl., 1783, p. 11. (Same as the above.)

Fringilla cristata GMEL. Syst. Nat., I, 1788, p. 926. (Same as the above.)

Coryphospingus cristatus CAB. et auct. recent.

This beautiful Finch is represented by a series of 73 specimens—53 adult males, 5 young males, and 25 adult females—taken as follows: January, 8; February, 0; March, 4; April, 2; May, 11; June, 3; July, 13; August, 9; September, 16; October, 7; November, 2; December, 5; without date, 3. Although the month of February is unrepresented, the species is probably a permanent resident at Chapada.

Young birds at first resemble the female, as shown by March specimens molting from the dress of the female into that of the adult male. In a young male taken in August the general plumage is intermediate between that of the female and adult male, while the crest shows brilliant red only on the basal half of the feathers, which is concealed unless the feathers are raised. This seems to indicate that the fully adult male plumage may not be acquired till after the third molt.

The molt covers the period from January to May, being at its height apparently in March. The plumage is in most perfect

condition from about the middle of May till into August, after which it becomes worn and somewhat duller.

Two eggs of this species, taken Dec. 5, 1882, are pale bluish white, thickly and rather evenly spotted, speckled and blotched with chestnut brown. They measure .85 x .63 in., and .83 x .62. The label gives the native name as "Joaõzinha."

67. *Porphyriospiza caerulescens* (Wied).

Tanagra caerulescens WIED, Beitr. Naturg. Bras., III, i, 1830, p. 541. (Cf. this Bulletin, Vol. II, pp. 140 and 225.)

This species, rare in collections, is represented by 35 specimens, taken as follows: January, 1; February, 2; March, 1; April, 2; May, 1; July, 7; August, 7; September, 7; October, 1; November, 2; December, 3. It is thus evidently resident at Chapada the whole year. The specimens include 20 adult males, 6 adult females, 2 young males of the year, and 7 young males of apparently the second year.

Adult Male.—The adult male in high plumage is deep dark blue, passing into lighter cobalt blue on the forehead, sides of the head, throat, foreneck, breast, rump, and lesser wing-coverts, purer and more intense on the latter. The feathers of the back are centered with darker below the surface, the dark centre becoming more distinct in the worn plumage at the close of the breeding season, while freshly-molted birds have the edges of the dorsal feathers edged, sometimes quite broadly, with rufous. Bill yellow, with the top of the upper mandible more or less brownish, varying to wholly yellow.

Young Male, in second year.—Above chestnut, with a bluish suffusion, passing into blue obscured by ashy brown on the rump, the feathers of the head and back narrowly centered with blackish; below blue, much paler than in the adult, with ashy edgings to the feathers, more brownish ashy on the flanks; lesser wing-coverts intense blue; bill as in the adult.

Young Male, in first year.—Above, including wing-coverts and inner secondaries, deep reddish chestnut, the feathers (except on the rump) centered with darker; below buffy brownish, much lighter on the middle of the abdomen, the feathers all narrowly streaked with blackish. Bill brown, lighter below.

Adult Female.—Above rusty brown, the feathers conspicuously centered with blackish; below grayish white, with a faint wash of pale buff, the feathers streaked narrowly with blackish.

The changes of plumage in this species appear to be nearly parallel with those in the North American *Passerina cyanea*.

[December, 1891.]

68. *Tiaris ornata* (Wied).—Represented by 14 specimens, 8 males and 6 females, all adult, taken as follows: February, 2; March, 1; June, 3; August, 5; November, 3. Doubtless a resident species, but not common.

The female (not mentioned by Sharpe, Cat. Bds. Brit. Mus., XII, p. 807) has been well described by Wied (Beitr. Naturg. Bras., III, p. 612).

69. *Poospiza cinerea* Bon.—Two specimens, adult males, Chapada, August 5 and 9, 1882.

70. *Zonotrichia capensis* (Müller).—This, Mr. A. E. Smith informs me, is an abundant bird about Chapada throughout the year. It is represented in the present collection by a series of 25 specimens, of which seven are birds of the year, several of them taken before the quills were fully grown, and all of course in the well-known spotted plumage of the young.

One of the adult specimens is a beautiful albino, in nearly uniform pale creamy white plumage throughout, except that the black head markings of the normal plumage are distinctly patterned in pale dusky gray.

Adult birds—7 males and 5 females—measure as follows: *Males*: wing (2.50–2.58), 2.54; tail, (2.20–2.29), 2.25; culmen (.44–.50), .47. *Females*: wing (2.44–2.50), 2.47; tail (2.04–2.26), 2.16; culmen (.44–.48), .46.

Some 30 or more eggs of this species in the collection present a wide range of variation in size, form, and coloration, being quite as variable as the eggs of the North American Song Sparrow (*Melospiza fasciata*). The ground color varies from pale blue to nearly white. The markings, of some shade of reddish brown, may be evenly diffused over nearly the whole egg, or mainly crowded about the larger end, and either rather few, covering less than one-third of the ground color, or abundant, covering nearly the whole surface; they may be either all very fine or may form rather large blotches. Three eggs selected to show variation in size and form, measure .75 x .57 in., .95 x .64, and .85 x .63, the latter indicating about the average size and shape.

The earliest name for this species is admittedly *Fringilla capensis* Müller (Syst. Nat., Suppl., 1776, p. 165), based on Dauben-

ton's Pl. Enl. No. 386, fig. 2 ("Bruant, du Cap de Bonne-Espérance"), which is also the basis of Boddaert's *Emberiza pileata*, named in 1783. Owing to the habitat originally given being erroneous, Boddaert's name was not recognized as applying to the present species till the fact was brought to light by Mr. Sclater in 1855 (P. Z. S., 1855, p. 160), the species in the meantime having been renamed five times by as many different authors. Müller's still earlier name having, as already said, precisely the same basis, was not brought to notice till 1864, when attention was called to it—as to so many other overlooked names given by P. L. S. Müller in his now rather famous "Supplement" to his edition of Linne's "Systema Naturæ,"—by Mr. Cassin (Proc. Acad. Nat. Sci. Phila., 1864, p. 255). Müller's name has not been adopted owing to the hitherto prevailing prejudice against geographically erroneous names—a prejudice now, however, evidently becoming a relic of the past.

The habitat of this species, as commonly accepted, extends from Mexico southward throughout Central and South America. It, however, does not preserve a uniform character throughout this vast area, but evidently presents several strongly-marked geographical phases, for most of which there is an abundance of names already at hand. While my material is too limited to permit of a satisfactory study of this group, it clearly shows that three forms may be readily distinguished. As a preliminary step to this it is necessary to fix the original name *capensis* to some one of them. As it is most likely that the specimen figured by Daubenton came either from Brazil or Cayenne, the name *capensis* of Müller (or *pileata* of Boddaert, for those who object to Müller's name) may be assigned to the form of eastern South America. The three forms I propose to recognize will then stand as follows:

1. *Zonotrichia capensis* (Bodd.). Habitat, Guiana and Brazil, south to Argentine Republic. Synonyms, *Fringilla matutina* Licht., *Tanagra ruficollis* Spix, *Zonotrichia subtorquata* Swain.*

2. *Zonotrichia capensis chilensis* (Meyen). Habitat, coast region of western South America, eastward to Bolivia. This is a much larger bird than restricted

* *Zonotrichia subtorquata* Swainson was based on Spix, II, pl. 53, fig. 3, which is *Tanagra ruficollis* Spix and not *Tanagra graminea* Spix as Swainson inadvertently assumed! See foot-note to p. 288 of Vol. II of Swainson's "Natural History and Classification of Birds."

capensis (wing .30 to .50 inches longer in the average), with the gray of the head darker, and the black spots on the sides of the breast more or less joined to form an indistinct collar.

3. *Zonotrichia capensis costaricensis*, subsp. nov. Habitat; southern Mexico, Central America, and southward to Colombia (Bogota), and probably to Ecuador. About the size of restricted *capensis*, but much darker and more strongly colored, the black streaks on the back much broader, the black stripes on the sides of the crown and sides of the head greatly increased in width, as also the black spots on the sides of the upper breast, which are generally more or less united across the fore breast; the rufous nuchal collar is much deeper in color, and the breast and sides very much darker, and of a more grayish olive brown.

Type, No. 48,206, ♂ ad., San José, Costa Rica, Sept. 14, 1889; C. F. Underwood.—Bogota and Costa Rica examples are practically indistinguishable.

Young birds in first plumage of *Z. capensis* and *Z. c. costaricensis* are rather more different from each other than are the adults, as shown by a comparison of seven specimens from southwestern Brazil (Chapada) with two from Costa Rica and one from Bogota. Not only is the general coloration much deeper in *costaricensis*, but the dark streaks, both above and below, are much broader and blacker.

71. *Ammodramus manimbe* (Licht.).—A series of 44 specimens, representing every month of the year except February and December.

Two of the three birds of the year taken in January still retain the greater part of the first plumage, having the throat, breast, and flanks narrowly streaked with black, and the head uniform with the back,—not gray streaked with black as in the adult. The other is in second plumage, with the breast and flanks strong buffy brown, but unstreaked; the head is brown streaked with blackish.

The adults vary much, independently of season, in respect to the amount of rufous bordering the feathers of the back. This bordering is much more pronounced, however, in birds in fresh plumage (April to July) than later in the season (September to November), when the rufous bordering as a rule disappears.

Two eggs of this species, called "Tic-a-Tic do Campo," taken Nov. 11, 1882, are white, with a delicate wreath of small spots of blackish brown and purplish lavender around the larger end. They measure .77 x .56 in. and .65 x .55. Another set of two eggs, very much incubated and in bad condition, are similar, except that the markings are heavier and much more conspicuous.

72. *Emberizoides macrourus herbicola* (Vieill.).—A series of 16 specimens, representing the months of March, April, June, July, August, September, October, and December, but taken principally during the months of August, September, and December.

Females are somewhat smaller than the males but otherwise not externally distinguishable. Different specimens vary considerably in the amount of olive yellow suffusing the plumage of the upper surface, and in the amount of buffy brown on the lower parts. Two specimens show blackish shaft-stripes on the lower tail-coverts; a December female is deep olive-yellow brown below. These variations are not correlated with either sex or season, but are probably due to age.

73. *Coryphospiza melanotis* (Temm.).—Two adult males, February and April, 1883; one adult female, July 8, 1883.

The female (apparently not previously described) has the head brown broadly streaked with rufous, the centres of the feathers black, and thus concolor with the back. Below throat and breast more buffy than in the male, with the feathers of the breast centered with narrow, and those of the flanks with broad dark reddish brown shaft-streaks. The bill is wholly reddish brown, instead of black above and yellow below, as in the male. There is a narrow yellowish white superciliary stripe, but there is no black on the head and no gray on the hind-head and nape, as in the male.

74. *Spinus yarrelli* (Aud.).—This species is represented by 5 specimens, 2 adult males, 2 young males, and 1 female, taken in May and July, 1883.

One of the young males is in nearly the garb of the female; the other is in transition plumage, with the throat and head patched with black.

75. *Sycalis pelzelni* Scl.—Two males, Cuyaba, Jan. 27, 1885.

76. *Sycalis arvensis* (Kittl.). CHUPACAPIM.—The series representing this species is exceptional in regard to season when the birds were obtained. Of the 80 specimens 37 were taken in the month of June, 1885, 7 in July, and 3 in August of the same year. Of the others 12 were taken in August, 1882, and 3 in

August, 1883, and the remaining 8 in September, 1882. The species is thus apparently a winter visitor of irregular occurrence. The September specimens—2 males and 6 females—are the only birds in breeding plumage. In these there is very little ashy to the feathers anywhere. August specimens show much less of it than do the June examples.

Ten males and ten females, taken at random, present the following measurements: *Males*: wing (2.80–2.96), 2.87 in.; tail (1.86–2.05), 1.97; culmen (.36–.40), .37. *Females*: wing (2.62–2.90), 2.77; tail (1.80–1.98), 1.91; culmen (.36–.40) .37.

77. *Ostinops decumanus* (Pall.). JAPU.—A series of 40 specimens, nearly all taken at Chapada, represents each month of the year except March and June; the greater part, however, were taken during July, August, September, October, and November. Males and females are about equally represented, while one November specimen (taken Nov. 12) is a half-fledged young bird. In this the plumage is softer, and the coloration is a little less glossy than in the adults.

Many adult birds present here and there throughout the plumage single feathers either broadly tipped with pale yellow or wholly of this color. About one-half of the specimens show a few of these feathers, in some instances only two or three, while other specimens are conspicuously pied with them; one shows two bright yellow feathers in the chestnut of the lower back and one in the crissum, and many others on the breast, neck, back, and among the larger wing-coverts. It is evidently an abnormality analagous to albinism.

The sexual variation in size is shown by the following measurements of 10 adult males and 10 adult females: *Males*: wing (8.10–9.44), 8.51; tail (6.60–7.66), 6.98; culmen (2.02–2.36), 2.17. *Females*: wing (6.10–6.86), 6.54; tail (5.20–5.80), 5.43; culmen (1.56–1.74), 1.64.

Four eggs of this species, from probably as many nests, taken Nov. 6, 1882, present a very wide range of variation in color and size. One egg is clear white, with a few small rounded spots and one or two broad streaks of black near the larger end, and measures 1.40 x 1.00 in. Another is light blue, with a few black

markings scattered over the whole surface, and measures $1.40 \times .93$. A third has the ground color reddish creamy white, profusely marked with large blotches and finer spots of brownish lilac, varying to a darker brown; it measures 1.40×1.03 . The fourth egg is similar, except that the markings are much less profuse, lilac mixed with dark bistre, and the ground color pale pinkish white. This is the smallest egg of the series, measuring only $1.25 \times .90$.

According to the labels the nests were at the ends of the branches in high trees. This species nests in large colonies with the Japuera (*Cassicus persicus*).

78. *Cassicus persicus* (Linn.). JAPUERA.—The 29 specimens representing this species were taken as follows: Abrilongo (near Chapada), February, 1883, 7 specimens; Chapada, June, 1885, 3 specimens; July, 1 specimen; September, 1; November, 12. Of the latter 5 are about half-grown young birds. The series consists of a nearly equal number of males and females.

The young birds are dull brownish black, with the yellow much paler than in the adults. Birds of the first year differ little in color from the nestlings; birds of the second year are in transition plumage,—dull-colored with irregular patches of the adult plumage.

The great sexual difference in size is shown by the following measurements of 8 adult males and 8 adult females: *Males*: wing (5.72–6.36), 6.03; tail (3.88–4.35), 4.08; culmen (1.21–1.32), 1.24. *Females*: wing (4.62–5.07), 4.86; tail (3.22–3.50), 3.36; culmen (1.02–1.12), 1.06.

Eight eggs of this species, taken Nov. 8 and 9, 1882, present much variation in size, shape, and color. Three, selected to show extremes of variation in size and form, measure $1.22 \times .70$, $1.18 \times .75$, and $1.07 \times .74$. The eggs are elongated and pointed, white, sprinkled with specks and small shell-markings of pinkish lavender, with superficial markings of sepia and blackish brown. The spots are usually wreathed about the larger end, but in one egg they are massed about the extreme tip of the small end, leaving the larger end plain white.

The descriptions of the nests written on the back of the collector's labels state that they were suspended from the ends of

the highest limbs of a tall tree in a clearing, the nest placed at a height of about 50 feet from the ground. On the same tree were about 50 nests, partly of this species and partly of *Ostinops decumanus*. The nests were oval in shape, built of grass, and about 14 inches in length.

79. *Icterus pyrrhopterus* (Vieill.).—Corumba, March 2 to April 15, 1886,—10 specimens; Piedra Blanca, Bolivia, April 21, 1886,—1 specimen; Albrilongo, February 20 and March 2,—2 specimens; Chapada, January 17 and 18, March 23, and July 22, 1883,—5 specimens; total, 18 specimens.

The March specimens were all in molt when taken, and include several birds in immature plumage. In one of these the greater coverts are tipped with white, the median covers yellowish white tinged with brown, and the lesser coverts pale chestnut. The inner wing-coverts are yellowish white, spotted with black, the wings brownish black instead of deep black as in the adult.

80. *Icterus croconotus* (Wagl.).—Two specimens,—♂ ad., Uacuryzal, Rio Paraguay, Feb. 14, 1886; juv., Cachoeira, Jan. 31, 1886.

The specimen in immature plumage is evidently a bird of the year, mainly in first plumage. It agrees with the adult in the pattern of coloration, except that there is a broad band of black across the middle of the interscapulum, and the lesser wing-coverts are black instead of orange. The clothing plumage is loose and fluffy, like that of a young bird in first plumage, except where a few new feathers are coming in, which are of a firmer texture. The black is everywhere dull brownish black; the yellow nearly pure yellow, except where the new feathers have come in, which latter are deep orange yellow, while the lower back and rump are tawny brownish yellow.

There is obviously a tendency, in adult birds of this species, to a very narrow black band across the interscapulum; sometimes it consists of a broken line consisting of a narrow black edging to a part of the feathers only; in others (probably birds of the second year) it forms a continuous well-defined black bar half an inch wide, while in the young bird above noted it is fully an inch in width. The lesser wing-coverts are at first black; in birds of

the second year they are pure deep yellow ; in older birds orange yellow, varying to deep fiery orange in birds in high plumage.

81. *Amblycercus solitarius* (Vieill.).—Three specimens, Corumba, April 7, and Piedra Blanca, April 20, 1886.

82. *Dolychonyx oryzivorus* (Linn.).—One specimen, Corumba, March 1, 1886,—an adult male in molt. (Cf. Chapman, Auk, VIII, 1890, pp. 43 and 122.)

83. *Agelaius cyanopus* Vieill.—Corumba, 5 specimens, March and April, 1886 ; Cachoeira, 1 specimen, Jan. 3, 1885.

Of these 6 specimens one only is an adult male, two are adult females, and three are young males, one of which is still in the garb of the female, while the other two are in particolored plumage, having about half molted into the livery of the adult male.

84. *Aphobus chopi* (Vieill.).—The 18 specimens representing this species were taken at Chapada during the months of May to December inclusive.

A single bird in first plumage (the quills about half grown, taken Nov. 10, 1883) is everywhere dull brownish black, in strong contrast with the deep shining black of the adult plumage.

These specimens are all referable to the true *A. chopi*, as distinguished by Leverkühn (Journ. für Orn., 1889, p. 104) from his *A. megistus*, as shown by the following measurements of 17 adult specimens, 10 males and 7 females : *Males* : wing (4.50-4.82), 4.62 in.; tail (3.20-3.54), 3.41 ; culmen (.84-.91), .88. *Females* : wing (4.24-4.54), 4.47 ; tail (3.02-3.42), 3.29 ; culmen (.84-.92) .87.

According to Leverkühn (l. c.), *A. megistus* measures : wing, ♀ 5.37, ♂ 5.67 ; tail, ♀ 3.94, ♂ 4.14 ; culmen, ♀ 1.00, ♂ 1.05.

85. *Cyanacorax chrysops* (Vieill.).—Corumba, 5 specimens, 4 of them taken Feb. 25 and 26, the other April 8, 1886.

86. *Cyanocorax cyanomelas* (Vieill.).—Represented by 8 specimens, taken as follows : May 23, 1 ; June 5, 1 ; September, 1 ; October, 1 ; November, 3 ; without date, 1.

A young bird in first plumage, with the quills not fully grown (taken Nov. 28) has the plumage loose and soft, but in coloration differs very little from adult birds, the head and whole lower parts being a little duller and browner.

The May and June specimens, being in fresh plumage, are much brighter colored than those taken in October and November, which present a bleached appearance throughout, but especially above, the back being ashy brown through the loss of the purplish tint of the fresh plumage.

These specimens are provisionally referred as above, as the only specimens of the *cyanomelas* group I have for comparison are two from Yungas, Bolivia, collected by Dr. Rusby, which I formerly referred (this Bulletin, II, p. 85) to *C. chilensis* (Sharpe ex Bonaparte),—presumably equal to *C. nigriceps* Sclater and Salvin (P. Z. S., 1876, p. 354), based on a Yungas specimen. The Chapada and Yungas specimens are certainly indistinguishable in color, but the latter are the larger. If *C. nigriceps* is different from *C. cyanomelas*, the present series is apparently referable to the latter, of which *C. nigriceps* is probably only a geographical form.

Six adult Chapada specimens measure as follows: wing (6.80–7.44), 7.13 in.; tail (6.08–6.50), 6.20; culmen (1.18–1.30), 1.25. Four of these specimens are sexed as males, one as a female, and the other is not marked for sex. The two Yungas specimens measure as follows: wing (7.50–7.74), 7.62; tail (6.56–6.76), 6.66; culmen (1.16–1.18), 1.17. The Yungas birds are thus larger, with, at the same time, a smaller bill.

87. *Uroleuca cyanoleuca* (Wied).—The 17 specimens representing this species were taken as follows: January, 1; April, 2; May, 1; June, 1; July, 5; August, 2; October, 1; November, 4.

The April–June specimens are brighter and much more richly colored than the October and November ones, the former being in fresh plumage, the latter in worn post-breeding condition.

Three eggs of this species, taken with the parent birds Nov. 21, 1882, are very uniform in size and color. The ground color is light pale blue, and the whole surface is covered thickly with dots and fine streaks of light and dark sepia, which are heavier and larger around the larger end, giving the general effect of a light bluish egg thickly peppered with dark brown specks. The eggs measure as follows: 1.28 x .94, 1.32 x .93, 1.28 x .93.

(To be continued.)